

## **AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Currently Amended) A ~~dielectric layer~~barrier structure, comprising:  
a densified amorphous dielectric layer deposited on a substrate by pulsed-DC, substrate biased physical vapor deposition,  
a soft-metal at the interface between the densified amorphous dielectric layer and the substrate, wherein the strain between the densified amorphous dielectric layer and the substrate is reduced by the soft-metal, and  
wherein the densified amorphous dielectric layer is a barrier layer.
2. (Cancel).
3. (Currently amended) The ~~layer~~structure of claim 1, wherein the barrier layer is also an optical layer.
4. (Currently amended) The ~~layer~~structure of claim ~~3~~1, wherein the barrier layer includes a TiO<sub>2</sub> layer.
5. (Currently amended) The ~~layer~~structure of claim ~~3~~1, wherein the barrier layer includes an Alumina/Silica layer.
6. (Withdrawn) The ~~layer~~structure of claim 3, further including a soft-metal breath treatment.
7. (Withdrawn) The ~~layer~~structure of claim 6, wherein the soft-metal breath treatment is an indium-tin vapor treatment.
8. (Withdrawn) The ~~layer~~structure of claim 1, wherein the barrier layer is also an electrical layer.

9. (Withdrawn) The ~~layer~~structure of claim 8, wherein the barrier layer includes a capacitive layer.
10. (Withdrawn) The ~~layer~~structure of claim 9, wherein the capacitive layer is a TiO<sub>2</sub> layer.
11. (Withdrawn) The ~~layer~~structure of claim 9, wherein the capacitive layer is an Alumina/silica layer.
12. (Withdrawn) The ~~layer~~structure of claim 8, wherein the barrier layer includes a resistive layer.
13. (Withdrawn) The ~~layer~~structure of claim 12, wherein the resistive layer is indium-tin metal or oxide.
14. (Withdrawn) The ~~layer~~structure of claim 8, further including a soft-metal breath treatment.
15. (Withdrawn) The ~~layer~~structure of claim 14, wherein the soft-metal breath treatment is an indium-tin vapor treatment.
16. (Withdrawn) The ~~layer~~structure of claim 1, wherein the barrier layer includes a tribological layer.
17. (Withdrawn) The ~~layer~~structure of claim 16, wherein the tribological layer is a TiO<sub>2</sub> layer.
18. (Withdrawn) The ~~layer~~structure of claim 16, wherein the tribological layer is Alumina/silica.
19. (Withdrawn) The ~~layer~~structure of claim 16, further including a soft-metal breath treatment.

20. (Withdrawn) The ~~layer~~structure of claim 19, wherein the soft-metal breath treatment is an indium-tin vapor treatment.
21. (Withdrawn) The ~~layer~~structure of claim 1, wherein the barrier layer is a biologically immune compatible layer.
22. (Withdrawn) The ~~layer~~structure of claim 1, wherein the biologically immune compatible layer is TiO<sub>2</sub>.
23. (Withdrawn) The ~~layer~~structure of claim 21, further including a soft-metal breath treatment.
24. (Withdrawn) The ~~layer~~structure of claim 23 wherein the soft-metal breath treatment is an indium-tin vapor treatment.
25. (Currently amended) The ~~layer~~structure of claim 1, wherein the dielectric film is TiO<sub>2</sub>.
26. (Currently amended) The ~~layer~~structure of claim 1, wherein a target utilized to form the dielectric film has a concentration of 92% Al and 8% Si.
27. (Currently amended) The ~~layer~~structure of claim 1, wherein ~~the~~a target utilized to form the dielectric film is formed from metallic magnesium.
28. (Currently amended) The ~~layer~~structure of claim 1, wherein ~~the~~a target material utilized to form the dielectric film comprises materials chosen from a group consisting of Mg, Ta, Ti, Al, Y, Zr, Si, Hf, Ba, Sr, Nb, and combinations thereof.
29. (Currently amended) The ~~layer~~structure of claim 28, wherein the target material includes a concentration of rare earth metal.

30. (Currently amended) The ~~layer~~structure of claim 1, wherein ~~the~~a target material utilized to form the dielectric film comprises a sub-oxide of a group consisting of Mg, Ta, Ti, Al, Y, Zr, Si, Hf, Ba, Sr, Nb, and combinations thereof.

31. (Withdrawn) The ~~layer~~structure of claim 1, further including a soft-metal breath treatment.

32. (Withdrawn) The ~~layer~~structure of claim 31, wherein the soft-metal breath treatment is an indium-tin vapor treatment.

33. (Withdrawn) The ~~layer~~structure of claim 1, wherein the dielectric film has a permeable defect concentration of less than about 1 per square centimeter.

34. (Currently amended) The ~~layer~~structure of claim 1, wherein ~~the~~a water vapor transmission rate through the barrier layer is less than about  $1 \times 10^{-2}$  gm/m<sup>2</sup>/day.

35. (Currently amended) The ~~layer~~structure of claim 1, wherein ~~the~~an optical attenuation through the barrier layer is less than about 0.1 dB/cm in a continuous film.

36. (Currently amended) The ~~layer~~structure of claim 1, wherein the barrier layer has a thickness less than about 500 nm.

37. (Currently amended) The ~~layer~~structure of claim 36, wherein the water vapor transmission rate is less than about  $1 \times 10^{-2}$  gm/m<sup>2</sup>/day.

38. (Currently amended) The ~~layer~~structure of claim 1, wherein a thickness of the barrier layer ~~thickness~~ is less than about 1 micron and ~~the~~a water vapor transmission rate through the barrier layer is less than about  $1 \times 10^{-2}$  gm/m<sup>2</sup>/day.

39. (Withdrawn) The ~~layer~~structure of claim 1, wherein the barrier layer operates as a gate oxide for a thin film transistor.

40. (Withdrawn) A method of forming a barrier layer, comprising:

providing a substrate;

depositing a highly densified, amorphous, dielectric material over the substrate in a pulsed-DC, biased, wide target physical vapor deposition process.

41. (Withdrawn) The method of claim 40, further including performing a soft-metal breath treatment on the substrate.
42. (Withdrawn) The method of claim 40, wherein the dielectric material is formed from a target comprising 92% Al and 8% Si.
43. (Withdrawn) The method of claim 40, wherein the dielectric material is formed from a target comprising of Titanium.
44. (Withdrawn) The method of claim 40, wherein the dielectric material is formed from a target material comprising materials chosen from a group consisting of Mg, Ta, Ti, Al, Y, Zr, Si, Hf, Ba, Sr, Nb, and combinations thereof.
45. (Withdrawn) The method of claim 41, wherein the soft-metal breath treatment is an indium/tin breath treatment.
46. (New) The dielectric layer of claim 1, wherein the soft-metal is indium-tin.
47. (New) The dielectric layer of claim 1, wherein the barrier layer is an electrical layer.
48. (New) A barrier structure, comprising:
  - a densified amorphous dielectric layer deposited on a substrate by pulsed-DC, substrate biased physical vapor deposition,
  - wherein the densified amorphous dielectric layer is a barrier layer, and
  - wherein a water vapor transmission rate through the barrier layer is less than about  $1 \times 10^{-2}$  gm/m<sup>2</sup>/day.

49. (New) The structure of claim 48, wherein the barrier layer is also an optical layer.
50. (New) The structure of claim 48, wherein the barrier layer includes a  $\text{TiO}_2$  layer.
51. (New) The structure of claim 48, wherein the barrier layer includes an Alumina/Silica layer.
52. (New) The structure of claim 48, wherein an optical attenuation through the barrier layer is less than about 0.1 dB/cm in a continuous film.
53. (New) The structure of claim 48, wherein the barrier layer has a thickness less than about 500 nm.
54. (New) The structure of claim 48, further including a soft-metal at the interface between the barrier layer and the substrate.